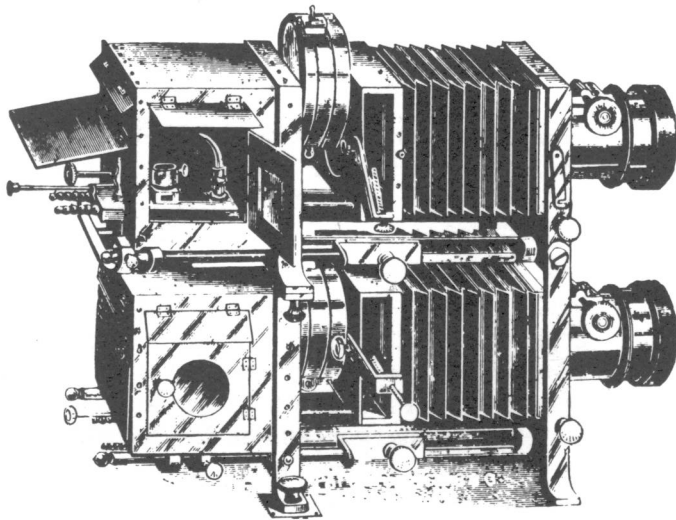




THE IMPROVED "BOSTON IDEAL."

The
Magic Lantern
Bulletin
Vol. 18 No. 3
Nov. 1988



Will SANTA bring a . . . MAGIC LANTERN?

THE GOOD OLD DAYS

by Erwin L. Hess

Over and over again—It's the same old story..
YES, AROUND THIS TIME OF THE YEAR IT ALWAYS IS! MOM USED TO SAY
SHE WISHED IT WAS DECEMBER THROUGHOUT THE ENTIRE YEAR!

TODAY'S SATURDAY, BUT
I DON'T FEEL LIKE PLAYIN'!!
I'D RATHER HELP YOU, MA
I'LL SCRUB THE STEPS
DIDYA HEAR ME, MA ?
I'LL SCRUB THE STEPS!

HOME
SWEET
HOME

YES, I HEARD
YOU ... THAT'S
MIGHTY NICE ...
HUM... M...

HEH
HEH
HEH

BIG TOY SALE
DOLLS
MAGIC
LANTERN
TOYS
IRISH
MAIL

WE'LL DO
ALL THE WORK,
MA SO YOU
AND PA CAN
REST!

TEMPORARILY
LITTLE "ANGELS"

12-4
12-3
ERWIN L.
HESS

Capr. 1960 by United Feature Syndicate, Inc.

Giambattista della Porta

by Lee Bailey

New developments during the Renaissance expanded the implicit comparison of the *camera obscura* beyond the eye to also imply psychic delusions and subjectivity. The Renaissance record of the *camera obscura* culminated in the widely distributed book *Magiae Naturalis (Natural Magic)*, by the Neapolitan Giambattista della Porta (1535-1615).¹ The purpose of including the *camera obscura* in a book on “natural magic” was to demonstrate that what seems to be awesomely magical apparitions on the blank screen are, on the contrary, merely the consequence of understandable natural principles of optics. Della Porta’s account was more complete than any earlier one, and it widely disseminated knowledge of the *camera obscura*. For this reason he was long considered its inventor.

Della Porta’s description was enthusiastic, for he believed he was divulging secrets. In 1558 he described

How you may see things in the darkness that are illustrated outside by the sun, and with their colors: Close all the windows . . . the hole may have the form of a cone, with its base facing the sun. Opposite it you arrange a white wall, linen cloth or stretched paper . . . you may see the faces, gestures, movements and dress of men, the dispersements of clouds in the sky, the azure sky and flying birds. If you arrive at the truth, you will be greatly pleased. ±

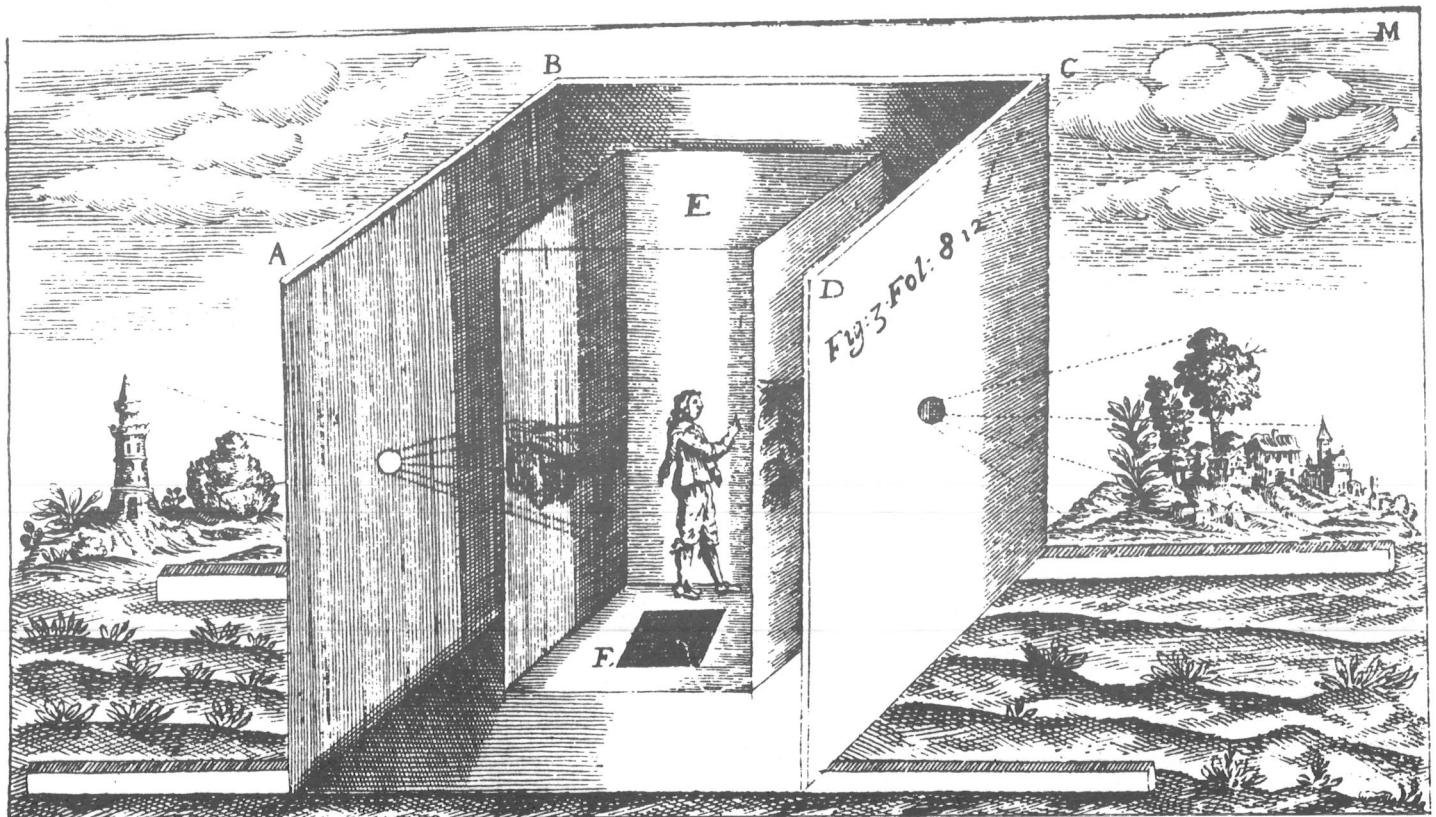
Della Porta made several very important contribu-

tions to the camera obscura. Like Leonardo, he saw the analogy with the eye, and he argued that this demonstrates vision by reception rather than by projection.

But going further, he recognized the importance of lenses. Eye correction lenses had been known to craftsmen for about 300 years, but they had been ignored by scholars, who regarded them as sources of distortion.³ Less than one page had been written on lenses up till his time, and he devoted several chapters to the topic. Though often in error, he was bold enough, in the face of distrust of the reliability of vision as a source of knowledge, to introduce lenses into his *camera obscura* studies as a way of improving perception.⁴ The positive evaluation of lenses was soon to issue in Galileo’s telescope, which by 1610 began to reverse the ancient distrust of visual perception. This reversal then led to Locke’s use of the *camera obscura* as an analogy for human understanding by 1690.

Della Porta welcomed all sorts of fantasies into the *camera obscura*. His is one of the first surviving records of the suggestion that the *camera obscura* be used as an aid to drawing for the unskilled, for artists who used it often kept it a secret.

If you cannot paint, you can by this arrangement draw with a pencil. Then you will only have to lay on the colors. This is done by reflecting the image downward onto a drawing board with paper.⁵



Here emerges a new aspect of the *camera obscura* as a potential image of psyche: the possibility for a memory-device in the dark room. This idea would eventually develop into photography's light-sensitive film. The addition of a *memory* technique to the artificial eye further moved the analogy of the *camera obscura* into an image of *psyche* itself.

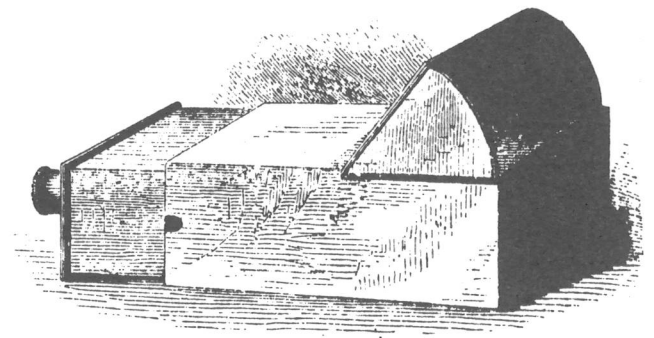
But not content with portraits and outdoor scenes, della Porta, who was also a dramatist, arranged theatrical productions on a sunlit stage outside the dark room. With scenery, actors and music, he wrote, "in a chamber you may see hunting, battles of enemies and other delusions . . . Nothing can be more pleasant for great men, scholars and ingenious men to behold."⁶ Spectators in the dark room were so seduced by the projected spectacle that they could not believe his explanation, and he was accused of sorcery.

This earliest forerunner of the cinema signaled a crucial turn in the development of the hidden fantasy of the dark room as the projecting psyche. No longer used only for scientific experiment, nor as Leonardo noted, only for seeing things "in their natural shapes and colors," the *camera obscura* now became a means of *projecting fantasy*. Early viewers of these enchanting projections were deluded. They could not imagine the possibility of projected images and attributed the trickery to sorcery. The psychic activity in the dark room was now greatly increased. In the *camera obscura* fearful delusions are now generated. Now in this black box psyche is stirred, souls are moved to wonder and fright. In the dark room psyche now appears alive in projection as never before.

To viewers today, who have become so blase about cinematic techniques, the wonder and fright have been reversed. It is no longer the image of projections inward which seems like sorcery. On the contrary, it is the image of psyche *not* restricted to projections into the dark chamber of subjectivity which is imagined as infantile or primitive.

The difference between the *camera obscura* and the magic lantern can be defined variously. Eventually the magic lantern "proper" came to be characterized by its artificial light, a concave mirror, lenses and illustrations on a transparent surface.⁷ Giambattista della Porta's 1589 record is the first surviving report of the dramatic effect of a *camera obscura* modified by artificial light and illustration. He described a *camera obscura* whose aperture opened into a second room filled with torchlight. An illuminated image was thereby projected into the dark room. Della Porta was fascinated with the way it seemed to hang in the middle of the chamber, generating "wonderful mirth . . . fear and terror:"

In a tempestuous night the Image of anything may be represented hanging in the middle of the Chamber, that will terrifie the beholders. Fit the Image before the hole, that you desire to make to seem hanging in the Air in another Chamber that is dark; let there be many torches lighted round about. In the middle of the dark Chamber, place a white sheet, or some solid thing, that may receive the Image sent in: for the spectators that see not the sheet, will see the Image hanging in the middle of the Air, very clear, not without fear and terror, especially if the Artificer be ingenious.⁸



1. *Natural Magic* went through 23 editions in Latin, and numerous translations. First published in 1558 in four sections, it was expanded to twenty in the 1589 edition. In the 1558 ed. the *camera obscura* is discussed in Bk. IV, Ch. 2, and in the 1589 ed., in B. XVII, Ch. 6. An English translation of the latter was published in London in 1658.
2. Della Porta, *Magiae* (1558), Bk. IV, Ch. 2.
3. V. Ronchi, "Optics and Vision." *Dictionary of the History of Ideas* (1973), III, 411.
4. Della Porta, *Magiae* (1589), Bk. VII, Ch. 10.
5. Della Porta, *Magiae* (1558), Bk. IV, Ch. 2.
6. Della Porta, *Magiae* (1589), Bk. XVII, Ch. 6.
7. H. Mark Gosser, "Kircher and the Lanterna Magica — A Reexamination," *Society of Motion Picture and Television Engineers Journal*, 90:10 (Oct. 1981), 972-978.
8. Della Porta, *Magiae* (1589), Bk. XVII, Ch. 7.

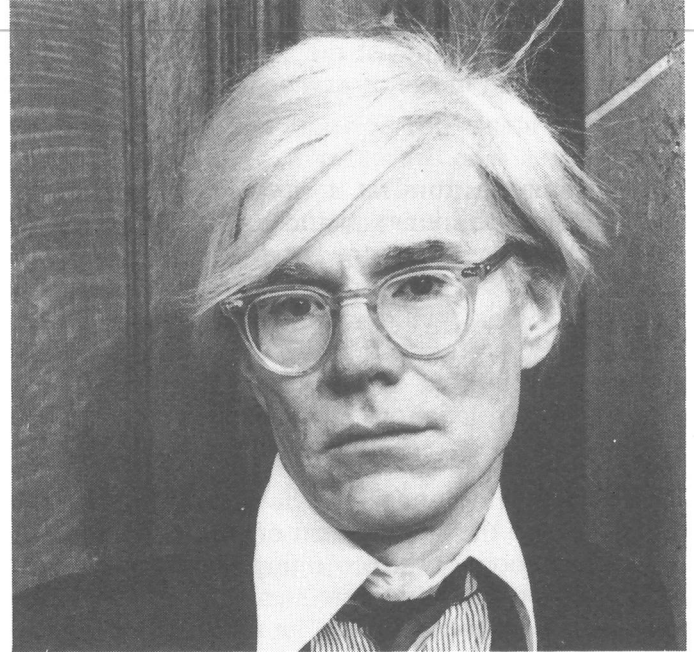
Warhol's Interest in the Origins of Cinema

by X. Ted Barber

The auction of Andy Warhol's estate by Sotheby's during April and May, 1988, was a widely publicized event, and much was made of his collections of cookie jars, Bakelite bracelets, Fiesta ware, and other examples of nostalgia, not to mention his fine art and furniture. However, journalists generally did not mention Warhol's interest in early optical devices. He in fact owned a flip-card iron Mutoscope made in America c. 1895 and finished in silver, and a sign advertising "Funny Moving pictures, One cent, Turn Crank." Also auctioned was a Quartoscope Penny Picture Machine manufactured by Mills Novelty Co. in 1897. This device, which was 20 inches high and had a silver cast iron stand, showed four different sets of twelve stereo cards. For four cents one could see all the sets. The mere fact that Warhol owned these objects was enough to drive up their prices. Sotheby's pre-auction estimate for the Mutoscope was \$350-\$450, whereas it went for \$1,320. The Quartoscope, estimated at \$300-\$400, realized \$1,870.

Although no magic lanterns were included in the Sotheby's event, Warhol's books related to this subject were auctioned. He owned copies of Olice Cook's *Movement in Two Dimensions* (1963) and G. A. Household and L. M. H. Smith's *To Catch a Sunbeam: Victorian Reality through the Magic Lantern* (1979). The 1979 Dover edition of *Muybridge's Complete Human and Animal Locomotion* was also in his possession. In the late nineteenth century Eadweard Muybridge of course gave frequent lantern shows centered around his photographs of locomotion. Since Warhol obviously knew something about magic lanterns, it would not be surprising if examples of these devices turned up in the remainder of his estate which remains unsold.

Warhol's own art exhibited some interesting parallels with lantern slides and early film. His silkscreen portraits of famous people, such as Marilyn Monroe and Elizabeth Taylor, done from 1962 onwards were based on photographic outlines to which were added bright color fields, such that the finished products resembled hand-tinted photographic slides or film. He also was fond of repeating the same image over and over, as can be seen in his *One Hundred Campbell's Soup Cans* done in 1962 or his *35 Jackies* of 1963. The effect here is reminiscent of looking at the series of stills on an unprojected length of film. Warhol also made some paintings which incorporated movement along with repetition. For example, his portrait of Ethel Scull created in 1963 consisted of a series of 36 shots of Scull taken in a photo-automat booth, which were then transferred to canvas and colored. Since Scull moved and posed as the camera was going off in the booth, the final painting calls to mind Muybridge's photographs of human locomotion as they appeared in published form. The principle was



similar in each case, even though Scull's movements were more random than those of Muybridge's models who moved naturally and in front of a battery of cameras.

Warhol's films should also be mentioned in this context. His productions of 1963 and 1964 had a number of similarities with the earliest cinema. For one thing, they were focused around a single subject or scene. *Sleep* (1963) was a film of nothing but the poet John Giorno sleeping. *Eat* (1963) was a record of Robert Indiana eating a mushroom. And the audience saw the Empire State Building in *Empire* (1964). Warhol might have even been inspired by Edison's 1896 film *The May Irwin-John C. Rice Kiss* when he made his own *Kiss*. This film of 1963 was a series of three-minute close-ups of various couples kissing. What is more, all of these Warhol films were silent, and he insisted that they be projected at silent speed (even though they had been shot at 24 frames per second). In general, Warhol also kept his camera stationary, as did the first filmmakers. Ronald Tavel, who worked on some of Warhol's films, claims that the artist was consciously making use of the static camera and that he considered it his "contribution" to cinema. Warhol simplified filmmaking at a time when it was growing increasingly complex so that its fundamentals could be better appreciated. Granting him its annual Independent Filmmaker's Award, *Film Culture* wrote in its Summer 1964 issue that Warhol took "cinema back to its origins, to the days of Lumiere, for a rejuvenation and a cleansing." There was, however, one major difference between Warhol's films and early one-reelers. Some of Warhol's works were quite lengthy, *Empire*, for example, being a mere eight hours long.

Despite all the parallels between Warhol's creations and early projection history, it is difficult to demonstrate conclusively that he was directly influenced by early slides or film. Warhol rarely spoke at length about the influences on his art, and interviewers were lucky if they received more than short answers from him. Also, it is not clear at what point in his career he developed an interest in the origins of cinema. He did not keep records of his purchases, so it is not possible to determine when he acquired, say, the Mutoscope. He might have turned his attention to this subject well after he had established his own creative techniques, only becoming interested in pre- and early cinema when he realized its similarities to his own work. Whatever the case may be, future biographers of the artist should take into account this aspect of his life, and now that his belongings and documents are being sorted and catalogued for archival preservation, perhaps more information on this subject will surface.



BUY/SELL/TRADE

Wanted: Slides of Christmas, Halloween, and anything by Joseph Biggs Beale. Terry Boston, 26 Side Bluff, Haddan, CT 06438.

Wanted: Smoke stack (outside dia. 1 11/16") and adjustable outside lens and housing w/notch (inside dia. 1 5/16") for toy "E.P. Germany" lantern. Please help. Mary A. Carey, 1168 So. Quail St., Lakewood, CO 80226. (303) 988-7365, after 5 p.m. only.

For Sale: 3000 glass slides, advertising, automobiles ships, N.Y.C. Godey Fashions and other. John V. Hodin, 7 Commonwealth Ave., Apt. 2, Boston, MA 02116, (617) 536-9477.

Wanted: Dissolving view and Stereopticon Equipment wanted, bits and pieces or complete systems. Any and all literature pertaining to same, original or reproductions. Don Sutherland, 28 Smith Terrace, Staten Island, NY 10304, (718) 447-3908.



Does anyone know how to recondition animated celluloid strips used in some toy lanterns? Contact: William Wwivshauser, 309 W. Broad, A-1, Mt. Pleasant, IA 52641.

Does anyone know the source of an article (chapter) on "The Magic Lantern" by Louis Walton Siple? It is in an 8 1/2 x 11 format, is very scholarly and discusses the Philadelphia slide makers. Contact: Terry Borton, 26 S. Side Bluff, Haddam, CT 06438.

X. Ted Barber, who is researching a doctoral dissertation *The History of the Magic Lantern Show in the United States*, is interested in hearing from anyone with broadsides, handbills, newspaper reviews, diary accounts, or other documentation of lantern shows before 1896. He would also like to track down issues of the lantern periodicals *The Exhibitor* (published between 1877 and 1894) and *The Monthly Didadem*. He will gladly reimburse anyone for photocopying or postage expenses, and his address is: 40 Waterside Plaza, Apt. 21 H, New York, NY 10010.

Stereograms and Lantern Slides

Today collectors often find the familiar KEYSTONE brand on many lantern slides available at flea markets and antique stores. Many of these slides came from the discarded collections of thousands of schools which purchased large sets of visual aides for geography instruction. These 3" x 4" lantern slides were duplicate sets of the stereogram cards which were purchased by schools for independent study by students. The lantern slides on the other hand were used for group instruction. While the stereo cards were purchased from Keystone the slides were usually given "Free" to schools who made large purchases. The following is an excerpt from *Oliver Wendell Holmes, His Pioneer Stereope and the Later Industry* by George E. Hamilton, 1949, documents the Keystone Story:

The Keystone View Company was first to sense the possibilities of selling stereographs to schools and colleges, for use in teaching. Early in the Century, educational psychologists became conscious of the over-emphasis educational procedures placed upon verbalism. Learning suffered because instruction was not made meaningful. Children read *words* and children were taught *words* — but their real understanding was limited to the facts of life that came under the observation *outside* the schoolroom. Educational psychologists said: "Why not bring the World into the schoolroom by means of the stereograph?" A group of noted psychologists, headed by Dr. James R. Angell then of the University of Chicago, signed a statement which read:

"If a stereoscopic photograph of a place is used with certain accessories (as special maps which show one's location, direction, and field of vision, etc.) it is possible for a person to lose all consciousness of his immediate bodily surrounds and to gain, for a short time at least, a distinct state of consciousness or experience of *location* in the place represented. Taking into account certain obvious limitations, we can say that the experience a person can get in this way is such as he would get if he were carried unconsciously to the place in question and permitted to look at it. In other words, while this state of consciousness lasts, it can be truly said that the person is in the place seen."

Both Keystone and Underwood & Underwood responded to educational needs of the times. Carefully selected and well-edited collections of educational stereographs were offered to schools. Both had so-called "600 Sets"; and Underwood's developed a "1000 Set." **Duplicate lantern-slide sets were furnished in order to provide group discussion of the marvels of reality experienced by individual students through the stereoscope.** The leading educational talent of the



Nation was enlisted in supplying teachers with source material, in order to facilitate the best use of the stereographic knowledge presented.

Competition between the two companies was intense. If a large city expressed particular interest, swarms of Keystone and Underwood salesmen arrived on the scene to promote their rival interests. It soon turned out to be a battle to the death. Underwood & Underwood finally *gave up the fight* and sold its magnificent library of stereoscopic negatives, with all educational rights, to the Keystone View Company.

This gave Keystone nearly *one million* selected stereoscopic negatives; and made it for a time the unchallenged leader in the stereoscopic educational business. Considerable investment in sales development seemed necessary, because educators and schools, although very much interested, with their usual conservativeness, *purchased* slowly. Keystone went ahead, nevertheless, making all possible improvements in the "600 Set," and promoting its purchase from Coast to Coast. At one time, it was estimated that 10,000 elementary schools had bought the complete Keystone "600 Set" of stereographs.

In *A Measure for Audio-Visual Programs in Schools*, published by American Council on Education, in 1944, recommendations for standard audio-visual equipment are made. Among requirements suggested under the heading "A Minimum goal in Supplying Equipment," along with a 16mm sound motion-picture projector for every 200 students, a 2" x 2" projector for every 400 students, and a 3 1/4" x 4" projector for every 400 students, we find as a prominent requirement *one set of 35 stereoscopes for every 400 students.*



Omni-Rama

Bob Bishop

This past year thousands of Seattle waterfront visitors have been entertained and astounded by the presentation, Genesis, showing at the Omni-Rama Dome theater. Relaxing in tilt back seats most patrons quickly feel the need of a seat belt as the theater seems to reel and move about them.

The Omni-Rama Dome is one of four major similar theaters in the United States. A smaller Dome at the Seattle Science Center is also in operation. The Dome theaters are a climax of the visual field in this decade. As 70mm film runs on a horizontal plane through "folling loop projectors," six track sound engulfs the spectators, giving a sense of being in the action presented.

But then, each decade had its own climax of the visual field. There was Cinema-Scope, Cinerama, 3D, and the "Dynamic Frame" as well as the Wide Screens of the late 1920s. (Which never really came into being as movie house owners rebelled against purchasing new projectors so soon after being forced to buy new equipment for the showing of talking movies.) Earlier still, Gances Triple Screens, four times as wide as it was tall, astonished all who view his creation.

Disney had his Circarana at Anaheim which made use of eleven cameras. The screen was but 8 feet high and 130 feet in the round. Very impressive but not nearly as realistic as Omni-Rama! Both were dwarfed by Cine'rama, a creation patented in France in 1897 by Raoul Grimoin-Sanson. His screen was 30 feet high and 330 feet in the circumference. Ten 70mm cameras were so closely matched that a continuous picture appeared to encircle the audience of 200. Seated in a

mock balloon basket, with realistic rigging and ballast bags about them the audience waited. Suddenly a voice cried out, "Ladies and Gentlemen, we are about to leave the garden of the Tuileries. Cast off!"

Hand tinted film showed the City of Paris falling away all around them. Moments later they appeared to land in the Great Square of Brussels, then on to England, the Riviera, Spain, Tunis, the Sahara and finally back to Paris! But Grimoin-Sanson's Cine'rama was but a three day wonder. The projectors under the audience created intense heat and the fire department authorities closed it.

Seattle's earliest pictures in the round occurred in 1909 during the Alaska Yukon Pacific Exposition. During the run of the Fair a feature called the "Spectatorium" spotlighted the Battle Between the Monitor and the Merrimac. Later on in the Cyclarama The Battle of Gettysburg was present. It is difficult to think of Cyclarama of the Civil War as traveling road show. Huge in proportion, 15-25 feet in height, 200-300 feet in the round they appeared in a score of major exhibitions about this country and the world from 1859 to the present. Of course the Panarama had been shown in this country as early as 1840.

Omni-Rama takes your breath away as I am sure did Grimoin-Sanson's Cine'rama. But on a recent trip to Gettysburg I viewed the century old Cyclarama, The Battle of Gettysburg. I was lost in awe and wonder as well as emotion and that is good enough for —

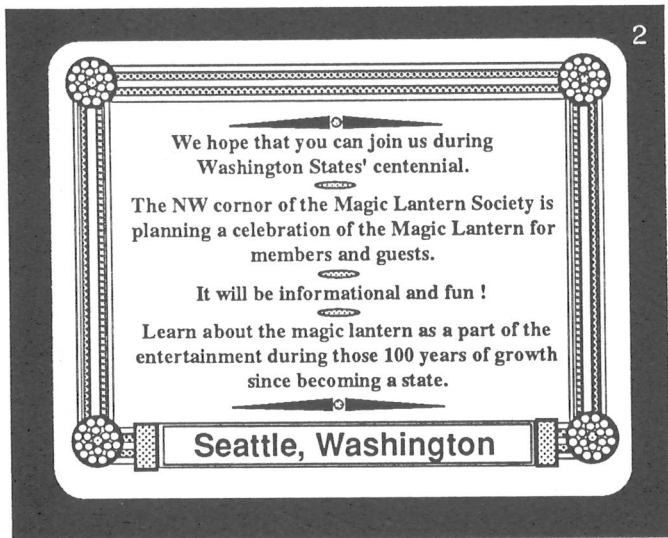
The Old Projectionist

New Member

Sutherland, Don
28 Smith Terrace
Staten Island, NY 10304
(718) 447-3908 (24-hours)
Occupation: Multimedia producer, writer/photographer
Interests: Dissolving View and Stereopticon equipment, literature, and "software". Especially interested in accounts of oldtime exhibits and exhibitors, ephemera related thereto.

Address Change

John V. Hodin
7 Commonwealth Avenue, Apt. 2
Boston, MA 02116
(617) 536-9477



Seattle in 1989

Dear Members,

We are moving ahead with plans for the Fourth International Convention to be held in Seattle, Washington on June 30, July 1 and 2, 1989. The tentative theme is to be **A Celebration of the Projected Image From the Past**. The convention site will be close to the Seattle/Tacoma area with accommodations for 10 to 12 members staying at NW members homes.

In the planning stage are:

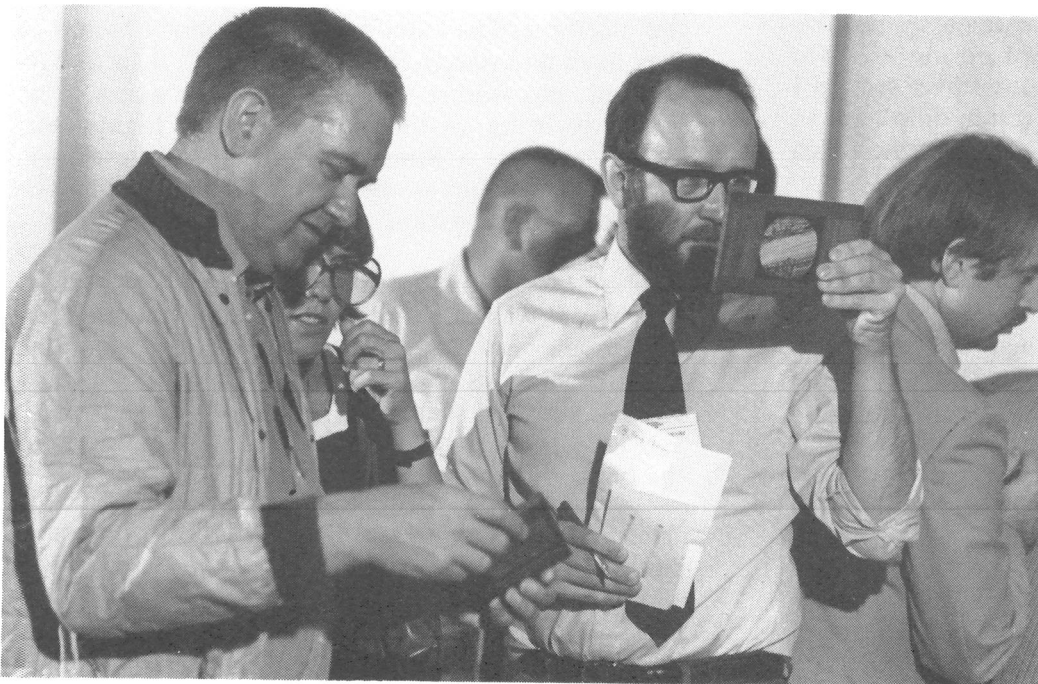
- Exhibit-one day, unusual items • Auction-Sun., July 2nd
- Sales Stalls
- Business Meeting - Financial Report, Plans for next convention • Banquet and Shows

At this time we are looking for information about who plans to attend and who would be interested in giving a show or program. The registration fee will not exceed \$35 per member.

We look forward to hearing from you.



Contact . . .
Larry Cederblom
1846 South 265th Place
Kent, WA 98032



*Scenes from the first
American Magic Lantern
Convention, Rochester,
New York.*

Too Much Audience Participation

*Not all audience participation in Magic Lantern shows was controlled or predictable. Clifford Hanley, in his 1958 book, **Dancing in Streets** describes a youth club in Glasgow, England in the late 1920s. By this time the motion picture had stolen the glamor and fascination from the lantern show.*

At this club, called the “Band of Hope,” boys and girls would sing hymns, listen to temperance lectures, and see an occasional lantern show. These shows were, however, much preferred over the often boring lectures.

As the author describes, the young men in this audience were a particularly difficult group to entertain.

The routine entertainment was a visiting speaker with a cute kind of title for his lecture, like “More Precious than Gold” (water) or “The Secret Enemy” (alcohol). Some brought anatomical charts to unroll and pictures of human tripe and cirrlosed liver sections, and so on, the kind of thing that interests toddlers to under-tens. Some of them didn’t altogether grip their audiences, and the Band of Hope was a noisy kind of evening, but not so noisy as when the arrangements broke down and a speaker didn’t appear. We had all the peevish impatience of a Roman arena crowd when the Christians have been withheld. All the same, I took everything in with passionate fixity. They didn’t have to work hard on me — I was their boy from the first hand-coloured liver section I met. The first rumblings of disaffection didn’t stir in my mind until the man with the water speech, which was years after my initiation.

He was a good enough performer, a bit on the thin nasal side vocally but fast and slick and well able to shut hecklers up without any help from the chairman’s gong. But he was just obsessed with water. He wasn’t satisfied to take the traditional swipe at alcohol — any liquid except pure water was a fraud according to this fish. Tea was an insidious drug; coffee a rampant poison; cocoa an innocent enough thing in itself but dangerous and futile because, in making coca, you actually *boiled the purity out of the water*. You could see that given half a chance he would turn against water itself and leave us nothing to drink except saliva. I got so fed up with water that I finished up de-converted.



Apart from dumpling night, the star bill was easily the magic lantern. You could tell a magic lantern night instantly, from the mounting excitement in the hall and the burgeoning fear among the officials on the platform. They could put on as many hymns as they liked and stretch the prayers out till their throats cracked, but sooner or later they were going to be forced to bring on the big moment — Lights Out. And if we were a Roman arena mob in the electric lights, what would we be in the dark? But why ask themselves the question? They knew the answer.

As Jimmie’s command or original mythology grew, and how it was to grow! he revealed to me privately the reason why Big Jake always sneaked into the meeting with his young brother on lantern nights. Jake, a likeable shambling youth of nineteen or so and long past Band of Hope age, always sat right at the back.

‘He’s operating an illicit still while the lights are out!’ Jimmie told me.

Finally the lecturer had been introduced and the moment of truth couldn’t be delayed longer.

‘And remember, boys and girls,’ the chairman cried, trying not to snarl, ‘Mr. Johnson is a stranger — he is our guest, and we must treat him as a guest, mustn’t we?’ And the girls, in their solid segregated block to the right of the aisle, chorused, ‘Yes!’ Confused shouts came from the male block on the left aisle and the chairman’s eyes narrowed.



‘And if any boy interrupts . . . or throws anything . . . he will be put out an once — and not only for tonight. He will miss Mr. Johnson’s lecture and *he will not be allowed back in. Ever again!*’ The words struck an answering spark in our hearts as we groped through pockets for jauries and crumpled paper and pencil-stubs. But we kept an eye on the lecturer too. Would he have a clicker, or bang his pointer on the floor, or just snap his fingers? It was too much to hope that he would just snap his fingers. But some of us had clickers of our own.

You could never tell what system he would use if he had any experience in this grim trade. He knew the value of surprise.

‘And remember, boys,’ the chairman roared, ‘there will be a monitor standing at the light-switch and I will not tell you when the lights are going to be switched on!’ There were mutters of ‘durty shame!’ and ‘Get them oot!’ and finally they went oot.

Mr. Johnson’s assistant stood at the rear end of the aisle, among us, operating the lantern and changing the slides. Before he even had the first one flashed, some fool would start blazing away with his clicker and give the game away. Mr. Johnson, smiling loftily to himself, would abandon his clicker and do his signals to the assistant by banging the pointer on the floor. It looked easy to impersonate this sound, but we never tumbled to it that the assistant knew Johnson’s patter too, and blandly ignored all the thump-thumps on the floor from out boot-heels.

They didn’t really sound right anyway, but when one very rare effort did fool him, we were insane with joy. Once the darkness had grown familiar and safe a shower of pellets and bits of pocket-lumber started flying across the light beam. They were thrown so that they would register on the screen as well as landing on the defenceless rows of sanctimonious girls on the far side of the aisle. And now and then a desperate character would manage to escape from his seat and stick his hand right in the beam, a surefire show-stopper for the pew-sitters in the immortal words of Variety. It didn’t happen often because there was a monitor at the end of nearly every row, ready to beat back rioters with his bare hands.

Suddenly there was a sharp movement from the platform and the house lights went up.

‘*That boy!*’ the chairman yelled. ‘*That yin there!*’ he added, his well-controlled English shattering under the tension.

‘Me?’ a beetle-browed lout near the front gazed up, hurt at the accusation. ‘Ah never done anythin!’ Instantly everybody near him shouted, ‘That’s right, it wisnae him, sir!’ and the chairman, losing the initiative, lifted his little gong with its wooden plinth and thundered with it on the table. ‘If there’s any more noise youse’ll *all* get put out and there’ll be *no lantern night!*’ He sounded as if he meant it.

The barrage thinned out and the screams were muffled to mere yelps and Mr. Johnson resumed his unflustered routine like a real pro. And it was a great show, when you could get a second to look at it.



Spirits and Shadows

Part One

by Colin B. Fryer

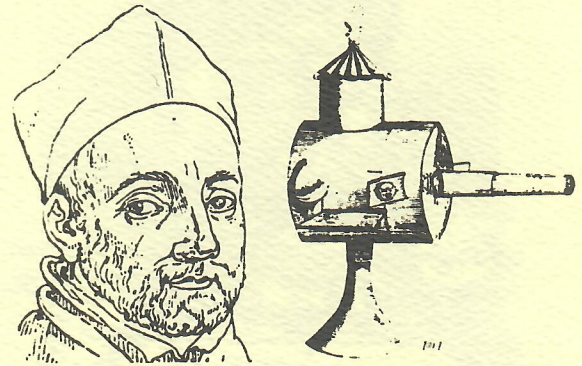
The art of projecting images by means of concave mirrors is almost as old as observing the pictures formed when light is allowed to pass through a small hole. It was known to the Chinese as long ago as the Chan Kuo period which flourished around the third century B.C. By the first century A.D. sorcerer-priests in what is now Sicily were using it to produce visits of the gods to their temples, which, according to Iamblichus were always accompanied by smoke and vapours. Roger Bacon experimented with the art. (It was probably these investigations which gave rise to the old Oxford tale that he once walked between the steeples of two of that cities' churches.) The art was almost certainly used by the kind or medieval wandering entertainers known as tregetours to produce supernatural effects such as those described by Chaucer in the "Franklin's Tale", and has been used by illusionists ever since.

The object to be projected is placed in the region between the centre of curvature of the mirror and its focus. When this object is strongly illuminated by the sun, an enlarged aerial inverted image appears, which under the right circumstances seems to be suspended in the air. The size of the image is inversely proportional to the distance of the object from the focal point and by varying this distance the image can be increased or decreased in size. When an upright image is required a second concave mirror is employed.

Even before this time the Chinese had discovered that it was possible to reflect on to a wall or similar screen the image of a design worked on the back of a mirror, though no pattern was visible on the surface of the mirror itself. Occasionally the mirror was given a false back inscribed with an entirely different design, in order to heighten the mystery. They called them 'thou kuang chien' — light penetration mirrors. We know them as 'magic mirrors'. One such 'magic mirror' about fourteen inches long, of Japanese origin, is on exhibition in the Barnes Museum of Cinematography at St. Ives Cornwall; another in the Museum of the History of Science, Oxford. The same principle is employed in the so-called 'English mirrors' of more recent origin.

In 1589, the versatile Neopolitan, Giovanni Battista della Porta (1535-1615) who divided his time between accumulating a vast knowledge of science, art, and nature, writing plays for the theatre, and administering his own learned society, the Academia degli Secreti (Academy of Secrets), also mentioned in the second edition of his many volumed "Natural Magic" that similar effects may be achieved with designs painted on the front surface of a concave mirror.

Around the middle of the following century, Father Athanasius Kircher (1602-1680), the celebrated German scholar who was known as the "doctor of a hundred arts" related in his "Ars Magna Lucis et Umbræ" published in 1646 that he once saw an excellent representation of the Crucifixion by this method; and it is recorded that the Emperor Rudolph of Bonemia was entertained in the same way to a procession of all his royal predecessors from Julius Ceaser downwards.



Kircher also tells us that the painted concave mirror formed an essential part of another projection apparatus. The mirror on which the designs were painted was placed behind a candle within a short, wide tube (the end of which when not in use could be closed with a hinged cover) that was fitted with a handle so that it could be held in the hand. Above the candle was a ventilator to let out the smoke. When the mirror was flat, Kircher found that it was necessary to use a convex lens to project the image. He noted: "through the aid of this device very small letters may be exhibited without any trouble"; and added that the illumination could be intensified if the interior of the cylinder was covered with an alloy of silver and lead to increase its reflectability. At least two of Kircher's pupils, Andreas Tacquet (1612-1660) from Antwerp, and Martin Martini (1614-1661), both Jesuits of the China Mission, are known to have given a series of lectures illustrated by the new technique on their return to Europe in 1652 and 1654, respectively.

A quarter of a century later, in 1671, Kircher described another form of projection apparatus in which the source of illumination was placed within a large wooden box. Immediately in front of this source was "a very good (convex) lens" mounted in "a pipe or tube". Behind the candle or lamp was a concave mirror "in order to increase the strength of the light". The pictures to be projected were painted in transparent watercolours upon long stripes of thin glass every other part of which had been rendered opaque. Usually there were eight pictures on each slide. These were passed vertically through a small opening in the tube just in front of the lens. "Thus", Kircher informed his readers, "the light of the lamp,

penetrating through the lens and through the image on the glass . . . will throw an upright, enlarged, coloured image on the white wall opposite". The accompanying illustration, he stressed, explained the system better than words.

Many authors tell of the wonderful effects Kircher was reputed to have obtained with this lantern. "By skillful manipulation", one writes, he "could make . . . figures appear at one moment as big as giants, the next as small as dwarfs; they could advance, retire, dissolve into nothingness, and then return in utterly different forms. On one occasion Kircher made mysterious handwriting materialize on the wall of a room from which he and his apparatus were excluded; and on another, by combining the effects of the lantern with those of the newly invented polished cylindrical mirror (which is capable of creating a coherent image from a spherically distorted — or poly optic — picture) the Jesuit stunned his audience by favouring them with a vision of the Ascension".

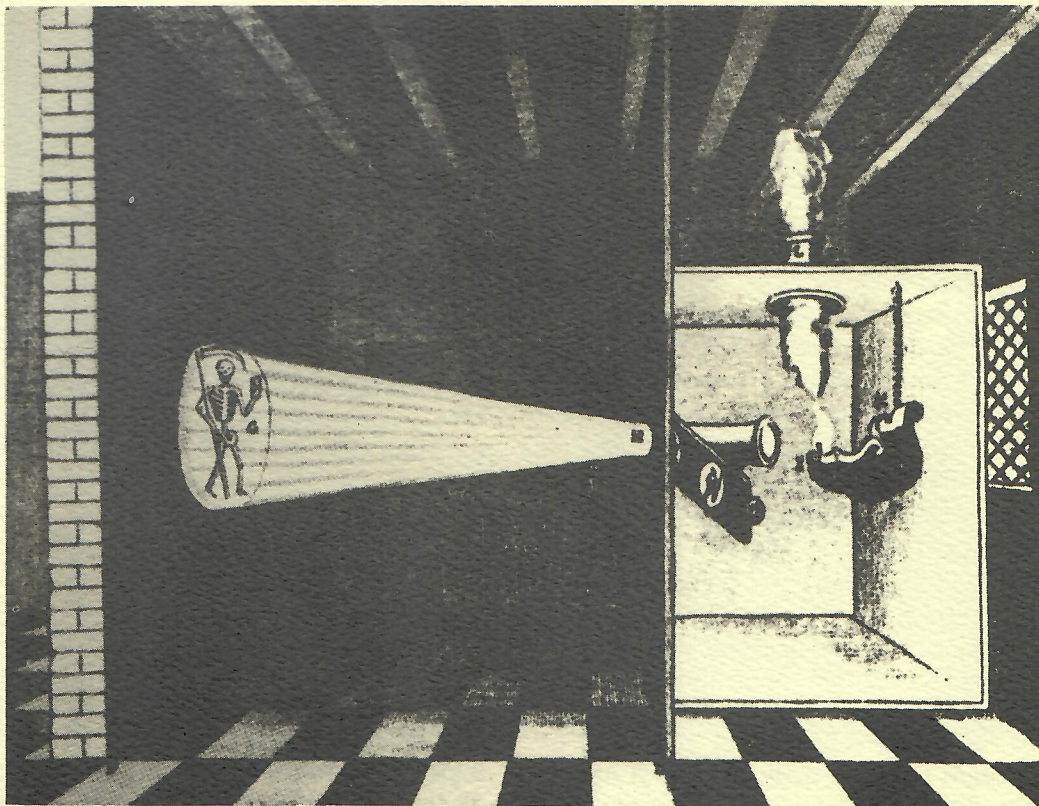
But alas! It is all just wistful thinking. Such things could not be done with this apparatus, for as you can see from both the description and the illustration which accompanied it, the focusing lens in front of the slide has been omitted. Moreover, the figures on the slides are shown the right way up like those on the screen instead of inverted.

Although Kircher cannot be credited with the invention of the improved magic lantern he was certainly

the first to realize that its principle could be adapted to project enlarged images of microscopic objects and thus overcome the great difficulty of the ordinary compound microscope — the inability to display an object to more than one person at a time. His specimen was placed on the surface of a concave mirror mounted on an axis at one end of a long horizontal board and positioned close to an aperture of a window shutter in such a way that the only light entering the room was reflected from it . . . At the other end of the board was a large convex lense. This was secured to a fitting which bisected these light rays and could be moved towards or away from the mirror in a long groove to facilitate focusing the image of the specimen on the screen. Kircher claimed that he was able to project living insects by smearing the mirror with a little honey in order to hinder their movements, and by placing a magnet behind the mirror was able to give the appearance of life to a dead fly impaled upon a needle.

Owing to their strong resemblance to a camera obscura and use of sunlight as an illuminent, such instruments first became known as "camera obscura microscopes"; but later acquired the name of "solar microscopes".

Shortly afterwards, Robert Hooke (1635-1703), the sickly, hunchback Curator of Experiments (or Chief



Professional Scientist) of the newly founded Royal Society of London, read a paper on "A contrivance to make the picture of anything appear on a wall, cupboard, or picture frame, etc., in the midst of a light room in day light, or in the night in any room which enlightened with a considerable number of candles". This arrangement which Hooke called a "camera lucida" functioned by projecting the images of illuminated and inverted objects by means of a mirror and large convex lense through an aperture into a room on any desired scale. If the objects could not be inverted, another lens was used to erect the image. It depended on the great brightness of the mirror for its effect.

By this time however, many other projection lanterns had appeared. Daniel Schwenter described one said to have been invented by Cornelius Drebel shortly before his death in 1634. J. F. Niceron sited another in 1638. "Light projecting apparatus", known in their language as 'tang kuang clung', are reputed to have been made in China by Sun Yun Chhiu around the year 1655. We know from his correspondence with his brother, Ludwig, that in the following year, the great Dutch astronomer, Christiaan Huygens (1629-1695), known by some of his friends as 'Summa Huygens', devised one, and that it was made by his friend Tacquet. He appears however, to have taken no further interest in it, evidently being afraid that if it became generally known that he had invented a device for the apparent production of ghostly apparitions and demons he would be accused of sorcery and his reputation as a serious scientist would be damaged. Such was his fear that he even turned down a request by his own father, who at that time was the Dutch ambassador to the Court of Louis XIV of France — the Sun King — to send him the original lantern so that he might amuse his friends.

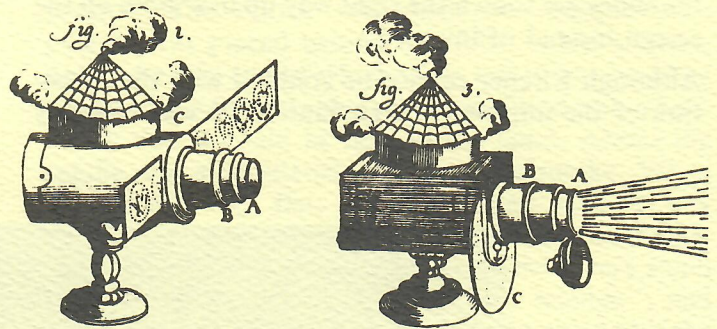
Thomas Walgenstein, a Danish mathematician of repute who had made the acquaintance of Huygens at the University of Leyden produced another about 1662, which Kircher later claimed was an improved version of his earlier instrument. (Much more likely it was an improved version of Huygens and that Kircher's lantern of 1671 was a bungled version of the Dane's apparatus). Walgenstein made his 'scare lantern' known to the general public by presenting a series of demonstrations, particularly in France and Italy.

According to Claude Francois Milliet Dechales (1621-1678), a French Jesuit priest, scientist and military expert, who was present at one of Walgenstein's demonstrations at Lyons in 1665 and who afterwards was allowed to examine the interior construction of the apparatus, the pictures were projected by means of two lenses separated by a large air space with a diaphragm between them. The first one was placed near the slide and formed a virtual image at the diaphragm. The virtual image, in turn, was projected by the second lens in the form of an enlarged

real image about four feet in diameter on to a screen about twenty feet away. These lenses were mounted within a tube, which could be, as Dechales emphasized, made longer or shorter in order to obtain a distinct and sharply defined image, regardless of the distance between it and the screen. He also discussed the required focal lengths of the lenses, of which the former was shorter than the latter. Unlike in Kircher's bungled version, a condensing lens was not used, the illumination being intersliced by a large concave mirror. Subsequently, Dechales devised various improvements of his own and even attempted three dimensional projections — unsuccessfully.

The following year projection apparatus, to which the Italian priest Francesco Eschinardi gave the name 'magic lantern' in his little known textbook, "Centuriae Optical Pars Altera" published in 1668, were being made and marketed by opticians and scientific instrument makers. In 1676 the Nurnburg opticians offered magic lanterns for sale in various sizes.

Several portable types of magic lanterns — sometimes known at this time as 'thaumaturga' (wonder projec-



tor) or megalographica' (giant writing lanterns) are described by Johann Zahn, (1656-1705) the German Pre-monstratension monk in his extensive optical writings. All are small and simple with plain bodies made of tin. Some of them are oblong in shape, others cylindrical. Each is surmounted by a conical corrugated chimney to let out the smoke from the candles or small oil lamp that provided the illumination. Their projection lenses were mostly mounted in a sliding tube to enable sharply defined images to be thrown on to the screen which was made of transparent taffetas, and unlike the modern arrangement was usually placed between the lantern and the audience. For some reason not readily apparent, one system even incorporated a negative lens between the projection lens and the condensor. The slides were hand painted and mounted on long narrow stripes of glass which measured anywhere from fourteen to twenty inches long and four inches wide. Other images were painted on the edge of a large circular disc. These slides were passed slowly through the projection beam in such a way as to create a primitive impression of movement.

Zahn also describes a lantern adapted to project the correct time onto a large 'clock' mounted on the wall. Such projection clocks later came into general use. Another curious application was an automatic wind direction indicator, the pointer on the projected dial being connected to a vane on the roof.

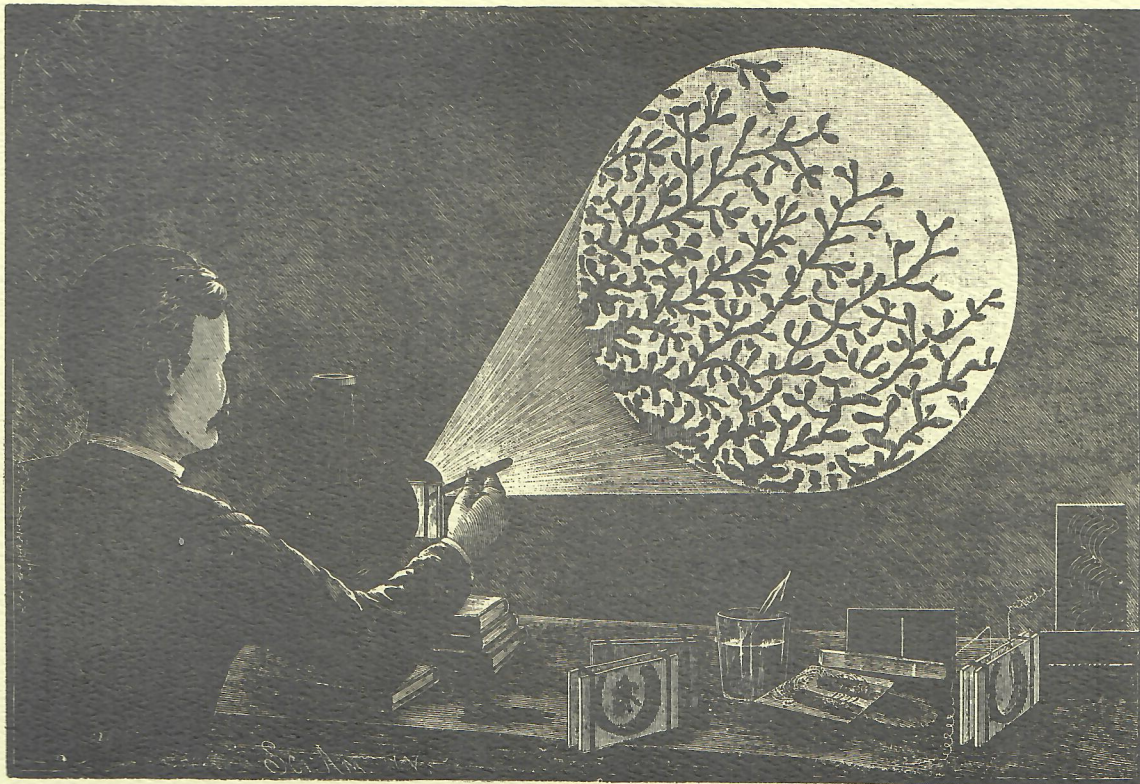
During the early years of the eighteenth century, special compact solar microscope systems were developed. We do not know who actually made the first one. One contemporary author states that it was Nathaniel Lieberkuhn (1711-1750), the Swedish "king of botanists"; another that it was Fahrenheit (who have his name to the thermometer scale) and that Lieberkuhn had it copied. Whatever the truth is, we know that Lieberkuhn possessed one of the earliest models, and that it was made for him by a London optician. His device consisted of a mounted "scioptic ball" from which the lenses had been removed and replaced by a tube with a simple screw-barrel microscope fitted to the end of it. The object to be projected was placed in this tube and illuminated by the sun. The microscope lens formed the image on the screen.

At first these solar microscopes were mounted so that the sun shone directly into them, with the result that

they had to be constantly re-aligned as the sun moved in the heavens. To overcome this inconvenience a mirror was fitted to the outside of the "scioptic ball". Initially this was fixed, but as time went on an adjustable mirror was introduced by James Cuff (c. 1708-1772), a London spectacle maker who traded at the Sign of the 'Reflecting Microscope and Spectacles' next to Sergeant's Inn Gate on Fleet Street. This was fitted to a revolvable circular disc mounted on a square wooden plate inserted into the shutter instead of the "scioptic ball" and operated by a system of levers and cords from outside the room. It enabled the sunlight to be directed continuously into the microscope irrespective of the position of the sun in the sky. A condensing lens was also fitted in the tube between the aperture and the specimen to intensify the light.

"The effect of this sort of microscope", wrote another London optician, the elder George Adams, "is stupendous, and never fails to excite wonder in an observer at his first view, in seeing a flea etc., augmented in appearance to seven, eight, or even ten feet in length, with all its colours, motions, and animal functions, distinctly and beautifully exhibited".

PLATE VIII.



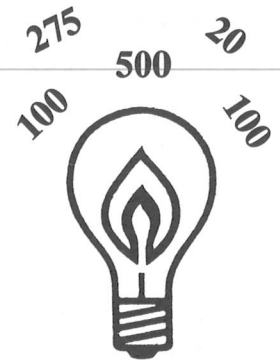
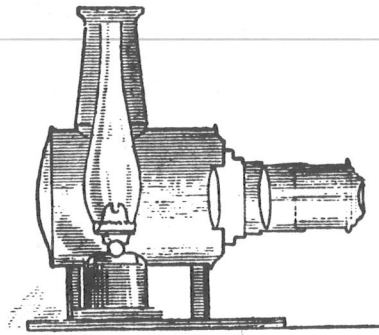
Projection of Cohesion Figures, and Other Experiments.

Projection Bulbs Revisited

by James Flanagan

Janet Tamplin wrote an article several years ago entitled: "The Conservation of Magic Lantern Material." The following quotation bears repeating:

"To return to the subject of illumination, I recommend that the very highest wattage you should ever use is a 275 watt photoflood; this is quite adequate for the very largest auditorium, providing good blackout facilities are available. A 150 watt bulb is preferable to the 275 watt bulb. Those who have seen the wonderful show given by Doug and Anita Lear on their canal boat 'Magic Lantern' may not be aware that they use two 20 watt bulbs in their biunial lantern, yet I doubt very much that anyone who has seen their show has ever found it be lacking in illumination. Admittedly, their special back-projection screen is helpful in making the most of the light source. This indicates another avenue to explore — not only the correct illumination to be established but also the most suitable screen upon which to project the image. Any bulb in excess of 275 watt is extremely destructive to any type of slide, and any lantern-



ist who persists in using a 500 watt bulb or even a 1000 watt bulb, can regard the life of his collection as very limited indeed. Victorian lanterns are not fitted with cooling devices, so there is a high risk of cracking condensers as well. Bulbs of this type produce such a glaring bright image that very often every brushstroke can be seen, producing an unpleasant effect of globules of paint, even in finely painted slides. Heat causes irreversible deterioration of photographic slides as well, eg., cracking."

I have always used a 100 watt bulb with a back-projection screen with beautiful results.

THE MAGIC LANTERN
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